

Avian Influenza and US TV News

To the Editor: Scholars have routinely noted ways in which scientific inquiry is isolated from public life and popular attention and have bemoaned relatively low levels of scientific literacy among lay audiences (1–3). While public understanding of science in the United States and elsewhere undoubtedly is not at the level desired by most scientists, apparent interest and hunger to learn are high for certain issues. These issues represent public communication opportunities.

Avian influenza is now such an issue. Although the risk for pandemic human influenza stemming from the avian influenza H5N1 virus is thought to be relatively low (4), media coverage of the disease, at least superficial and episodic coverage of disease incidence, has been dramatic. Aside from existing coverage, however, what type of coverage should the issue receive according to viewers? Are they interested in the issue, if at all, as a matter of scientific inquiry or simply as a sensational threat to individual survival?

We report here relevant results from a national survey of local television news viewers in the United States. Evidence from an Internet-based survey conducted in May 2006 suggests that viewers not only think that the potential direct impact of avian influenza on their own lives should be covered by reporters but also have interest in scientific investigation of the disease.

Working with Survey Sampling International (available from www.surveysampling.com), we recruited by email a nationally representative sample of regular television news viewers. Potential respondents were offered the chance to win a cash prize. Only those ≥ 18 years of age and those who watched local television news show at least twice a week in recent months contributed to the final survey. We report here data from the

2,552 respondents who met those criteria and who answered all relevant questions.

Participants represented a reasonable cross-section of the general US population of television news viewers. Participants were 18–90 years of age (mean age 52, SD = 15.45). Educational attainment was mixed: 37% reported having completed at least a 4-year undergraduate degree, and 63% had completed <4 -year degree. The final sample was 87% Caucasian, 8% African American, and 2% Asian; 8% also identified themselves as Hispanic or Latino. Approximately 54% of the sample was female, and 11% reported that they work for an organization directly involved in science.

When offered a 7-point scale that ranged from “not at all important” to “very important” to describe the priority that local television news should assign to addressing the “direct impact” of avian flu on one’s own life and the lives of others, $\approx 80\%$ chose ≥ 5 . Approximately 42% of respondents chose the highest level, indicating it was very important for local television news to cover this angle of the story. Regarding deeper perspectives on the story, $\approx 81\%$ of respondents chose ≥ 5 on the 7-point scale of importance when asked about potential coverage of how avian flu spreads and why scientists are finding it difficult to contain; 41% of respondents thought that it was “very important” that television reporters explicitly discuss that aspect of the issue. Moreover, 69% of respondents, by offering ≥ 5 on the 7-point scale, thought the television news should focus on the connection of avian flu to other issues, such as business and travel. Clearly, we are living in a time in which news audiences would tolerate much more than the soundbites and superficial coverage often offered with regard to infectious disease research.

Equally as striking are the demographic characteristics of those who

believe that local television news should cover the process of scientific discovery in this arena. We conducted a simple regression analysis to predict 1 of the items noted above, i.e., perceived importance of television news discussion of how avian flu spreads and of the efforts of scientists. We used formal employment with a scientific institution, level of educational attainment (a 5-level variable treated here as interval), and reported conversation with others about science in recent months as predictors. Educational attainment actually bore a negative relationship to interest in such coverage, $\beta = -0.14$, $p < 0.01$, and formal affiliation with a scientific institution bore no statistically significant relationship, $p > 0.10$. (Past conversation about science bore a positive relationship, $\beta = 0.06$, $p < 0.01$.)

Results suggested a prime opportunity for public communication efforts not just because of issue timeliness but also because of apparent widespread hunger for information among the US television news viewers. Health and science communication professionals could address this interest and desire to boost popular awareness of epidemiologic and medical inquiry.

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Resistance to Dihydroartemisinin

To the Editor: The emergence of widespread resistance to chloroquine and sulfadoxine-pyrimethamine in Africa has caused a sharp rise in deaths from malaria. The World Health Organization therefore urgently recommends replacement of these

drugs, particularly with combinations that include an artemisinin compound (AC) (1). In 2006, although >40 countries have adopted artemisinin-based combination therapies as their first-line treatment for malaria, only a few of these countries actually use these combination therapies because of limiting factors such as high cost (2). When used as monotherapy, ACs are associated with high rates of recrudescence, possibly because of their short elimination half-lives (3). Most artemisinin-based combination therapies contain, in addition to ACs, a partner drug against which resistance has already developed (e.g., mefloquine, amodiaquine, lumefantrine); reports of relatively low efficacy of the combination artesunate-amodiaquine have been recently published (4). In 2005, Jambou et al. claimed to have found the first cases of in vitro *Plasmodium falciparum* resistance to ACs (5).

We assessed the in vitro susceptibility to dihydroartemisinin (dhART), the biologically active metabolite of artemisinin derivatives, of *P. falciparum* isolates from travelers returning to France from various African countries during 2004–2006. In addition, we searched for polymorphism in the *P. falciparum* adenosine triphosphatase-6 (*PfATPase6*) gene, which was reported to be associated with in vitro artemether resistance (5). We also studied polymorphism (a 3-bp indel) in the gene of the ABC

transporter G7, which was reported in 2005 to be associated with in vitro response to artesunate (6).

Determination of in vitro dhART susceptibility by using the isotopic semimicrotest method (7) was successful for 397 isolates. The most represented countries were Cameroon (17%), Côte d'Ivoire (14.5%), Mali (12%), Comoros Islands (8.5%), and Senegal (6.5%). Patients were ≤ 75 years of age (mean 31, SD 17 years), and the male:female ratio was 1.5:1. The 50% inhibitory concentration (IC_{50}) values ranged from 0.02 to 31.8 nmol/L, with a geometric mean of 1.31 nmol/L and a median of 0.68 nmol/L. IC_{50} values were <1 nmol/L for 264 isolates, 1–10 nmol/L for 127, and >10 nmol/L for 6. Thus, some isolates showed a diminished susceptibility to dhART, but only 1 isolate had an IC_{50} >30 nmol/L (31.8 nmol/L).

DNA sequencing of 900-bp and 240-bp PCR products, including the 769 and the 243/263 *PfATPase6* codons, respectively, was performed in a subsample of 154 isolates. All isolates had the S769 wild codon except 1 susceptible isolate (IC_{50} = 0.83 nmol/L), which had a S769N mutant type codon (Table). We found no polymorphism in codon 263. This position may be scrutinized to monitor anticipated artemisinin resistance, according to a recently published structure-function study (8). Conversely, we found 2 isolates that had IC_{50} values of 4.2 nmol/L and

Table. Polymorphism in *PfATPase6* and G7 genes and in vitro susceptibility to dihydroartemisinin of 154 *Plasmodium falciparum* isolates*

Gene	Predicted products	Position	Amino acid	Nucleotide change	No. isolates	Dihydroartemisinin IC_{50} (nmol/L)
<i>ATPase6</i>	Sarcoplasmic reticulum calcium-transporting ATPases	769	S	AGT	153	0.1–31.8
			S→N	AAT	1	0.83
		263	L	TTA	154	0.1–31.8
			L→S	TCA	0	
G7	ABC transporter	1,390	H	CAT	152	0.1–31.8
			H→Y	TAT	2	4.2; 6.4
			Wild	(AAT) ₄	69	0.1–25.9
	Mutant	(AAT) ₃	85	0.15–31.8		
			(3-bp indel)			

**PfATPase*, *Plasmodium falciparum* adenosine triphosphatase; IC_{50} , 50% inhibitory concentration.